# Restoration of Excessive Interocclusal Restoration Space Post-Mandibulectomy using a Two- Platform Implant Supported Fixed Prosthesis

**Virat Hansrani** BChD, **Omnia Saleh** PhD, **Luis Del Castillo** DDS, **Gurkan Goktug** DDS

**Department of Restorative Sciences & Biomaterials | Boston University Henry M. Goldman School of Dental Medicine, Boston, MA**

## Statement of the Problem

Patients with large mandibular defects face complex rehabilitation challenges, particularly with large interocclusal spaces.

A 56-year-old male presented to Boston University, having undergone a segmented mandibulectomy due to oral carcinoma treated in 2005 (Figure 1). The patient had implants in the edentulous area but remained unrestored for 18 years, which severely impacted his chewing function and social well-being.

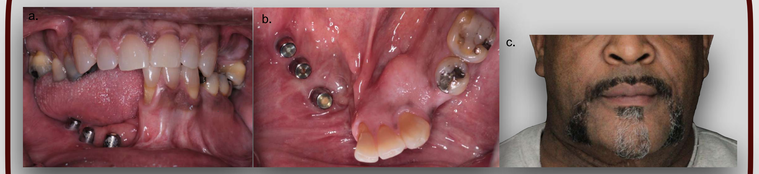

Fig.1 (a, b, c)

## Objectives

**Restore** patient esthetics, facial profile and chewing function with a fixed solution.
**Analyze** and address the challenges associated with restoring a large interocclusal spaces with fixed prosthesis.
**Design** and evaluate a two-platform fixed implant prosthesis to manage large interocclusal space.
**Apply** and optimize digital technology to create a custom two-platform prosthesis, ensuring ease of insertion and retrievability.
**Educate** the patient about the delivered prosthesis and home care instructions.

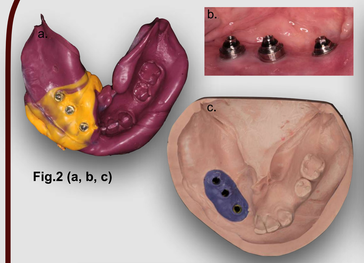

Fig.2 (a, b, c)

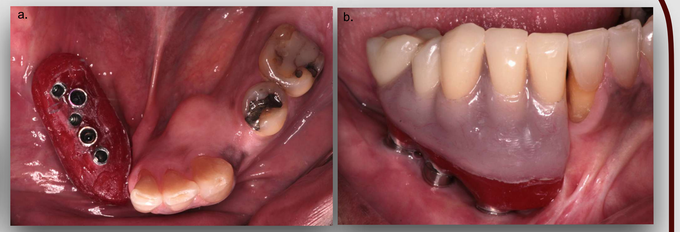

Fig.3 (a, b)

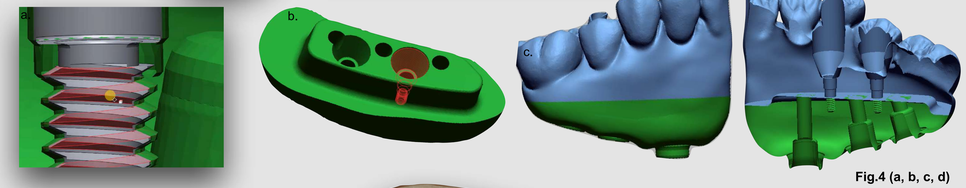

Fig.4 (a, b, c, d)

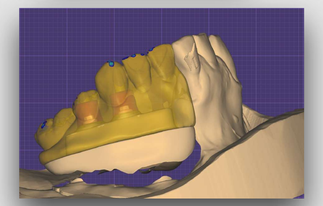

Fig.5

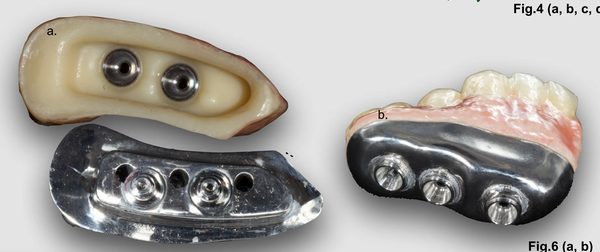

Fig.6 (a, b)

Fig.7 (a, b, c)

## Material and Methods

**Impression Taking**

- Implant level impression with custom tray was taken. The interocclusal space was determined to be 33 mm. Multi-unit abutments (MUA) selected based on the gingival depth (Figure 2).

**Provisionalization**

- **Platform 1** Non-engaging temporary abutments splinted, and two lab analogs splinted, using autopolymerizing acrylic resin (GC Pattern Resin, GC America).
- **Platform 2** Non- engaging temporary abutments splinted within wax tooth set up. This was processed using compression moulding.
- Platform 2 non engaging temporary abutments screwed into the lab analogs in platform 1 (Figure 3).

**Prosthesis Design & Production**

- MUA level prosthesis was initially designed using ExoCAD (3.1 Rijeka, Germany).
- Prosthesis design separated into two platforms to gain access to prosthetic screw.
- MUA scanned and measured with digital caliper. This measurement used to create abutment interface for a MUA insertion in platform 1, which was designed using Solidworks software (MA, USA) (Figure 4).
- Prototype printed using Carbon M2 printer to verify passive seating of platform 1 and platform 2.
- STL of platform 1 printed in Titanium alloy (3DRPD, Orion, Canada), The MUAs were torqued into platform 1.
- Platform 2 designed on MUA level margin, based on the original design using ExoCAD (Figure 5).
- Platform 2 milled with 3Y Zirconia, colored and polished (Figure 6).

**Delivery & Maintenance**

- The prosthesis was delivered to the patient and detailed post operative instruction were given to him (Figure 7).

## Conclusion

The restoration of the large mandibular defect using a fixed 2 platform implant prosthesis has been completely life changing for the patient. He reports greater facial fullness, improved chewing capacity, and his social and mental wellbeing has increased.

**Reference:**

Stimmelmayr M, Edelhoff D, Güth JF, et al: Wear at the titanium–titanium and the titanium–zirconia implant-abutment interface: a comparative in vitro study. Dent Mater 2012;28:1215-1220.